amended claim 5 to delete the word "comprising," and to insert the phrase --wherein (c) comprises--, and to correct an obvious typographical error. Applicant also has amended claim 11 to delete "cii)" and insert "(c)(ii)."

The foregoing amendments do not narrow the claims, and are not made for "a substantial reason related to patentability." The errors corrected did not render the claims indefinite under 35 U.S.C. § 112. Applicant submits that the rejection was improperly made under 35 U.S.C. § 112 because, as the claims were submitted, "one skilled in the art would understand all language in the claims when read in light of the specification." *Rosemount, Inc. v. Beckman Instruments, Inc.*, 221 U.S.P.Q. 1, 7 (Fed. Cir. 1984), citing *Caterpillar Tractor Co. v. Berco, S.P.A.*, 219 U.S.P.Q. 185 (Fed. Cir. 1983). The errors could have been merely objected to, and not made the subject of an rejection under 35 U.S.C. § 112.

Rejection of claims 23-26 under 35 U.S.C. § 112, first and second paragraphs

The examiner contends that claims 23-26 are indefinite and not enabled because the claims "fail to recite critical reaction steps," and because the claims "literally read on treating the cleavage mass itself to remove the salts." The examiner contends that treating the cleavage mass itself to remove the salts is neither disclosed nor enabled, and that "the specification discloses treating only phenolic bottoms stream in this manner which the claims fail to particularly point out.

Response

Applicant draws the examiner's attention to page 12, ll. 8 of the specification (emphasis added):

In a particular embodiment of the invention, reference may be had to the design depicted in Fig. 1. **In the neutralizer (10), the sulfuric acid present in the hydrocarbon phase of the cleavage mass forms a Na_2SO_4 salt in the aqueous phase which leaves the neutralizer through line (14). A portion of the salty aqueous stream may be recirculated back to the neutralizer through line (14), and a portion may be discharged through line (15).**

Claim 23 requires the salts to be removed "through one or more aqueous streams discharged and purged from" the process. As seen above, one of these "aqueous streams discharged and purged from the process" may be produced by direct treatment of the cleavage mass (stream 15); one of the streams may be from the wash drum (20) (specification, p. 12, ll. 20-27, stream 23); and one of the streams is derived from the "remainder" after removal of acetone, which is illustrated as a crude phenol bottoms, by phase separation (stream 83) (See specification, p. 20, l. 30-p. 26, l. 5).

Claim 23 also defines a process for achieving 80% removal of salts "**present in** a partially or wholly neutralized aralkyl hydroperoxide cleavage mass." (Emphasis added.) The examiner does not deny that the specification is enabling for salts "**present in**" the "partially or wholly neutralized aralkyl hydroperoxide cleavage mass." In fact, it is the neutralization of the cleavage mass that produces the majority of the salts that must be removed from the process via these "one or more aqueous streams." From the foregoing lmitations, "one skilled in the art would understand all language in the claims when read in light of the specification." *Rosemount, Inc. v. Beckman Instruments, Inc.*, 221 U.S.P.Q. 1, 7 (Fed. Cir. 1984), citing *Caterpillar Tractor Co. v. Berco, S.P.A.*, 219 U.S.P.Q. 185 (Fed. Cir. 1983).

With respect to the examiner's contention that "critical reaction steps" are omitted from the claims, the examiner has not specifically pointed out any such omitted "critical reaction

steps." Applicant denies that the claims omit critical reaction steps, and traverses this technical rejection. Applicant respectfully requests that the examiner provide a "full development of the reasons" for the rejection rather than merely giving a "conclusion coupled with some stereotyped expression." MPEP 706.03.[1]

Applicant also notes that claims 23-26 are "means plus function" claims. Claim 23 defines the "combined flow rate of all aqueous purged stream(s)" as "5 parts by weight per hour based on a flow rate of 100 parts by weight per hour of said cleavage mass fed to **a means for** separating said cleavage mass into a crude ketone stream and a crude phenolic stream." Claim 23, emphasis added. The examiner is required to read the foregoing "means-plus-function" portion of claim 23 " to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." 35 U.S.C. § 112(6). "The 'broadest reasonable interpretation' that an examiner may give means-plus-function language is that statutorily mandated in paragraph six. Accordingly, the PTO may not disregard the structure disclosed in the specification corresponding to such language when rendering a patentability determination." *In re Donaldson Co.*, 16 F.3d 1189, 29 USPQ2d 1845 (Fed. Cir. 1994); MPEP 2181.

When the "means plus function" portion of the claim is read as required by statute--"to cover the corresponding structure, material, or acts described in the specification and equivalents

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1 The primary object of the examination of an application is to determine whether or not the claims are patentable over the prior art. This consideration should not be relegated to a secondary position while undue emphasis is given to nonprior art or "technical" rejections. Effort in examining should be concentrated on truly essential matters, minimizing or eliminating effort on technical rejections which are not really critical. Where a major technical rejection is proper (e.g., lack of proper disclosure, undue breadth, utility, etc.) such rejection should be stated with a full development of the reasons rather than by a mere conclusion coupled with some stereotyped expression. MPEP 706.03.

thereof"-- the claims recite all critical reaction steps, the claims are definite, and the claims are enabled by the specification.

Rejection of claims 27-38 under 35 U.S.C. § 112, first and second paragraphs

The examiner contends that claims 27-38 are indefinite and not enabled because the claims "fail to recite critical reaction steps," and because the claims "literally read on treating the crude phenol itself to remove the salts." According to the examiner, "the specification discloses treating only phenolic bottoms stream in this manner which the claims fail to particularly point out."

Claim 27 has been amended to specify that the stream treated is the crude phenolic bottoms stream. Claim 29 has been amended to specify that it is the "remainder of said crude phenolic stream" after separating acetone that is fed to the phase separator. The addition of this limitation does not narrow the claim but merely expresses a feature which was inherent in the claim already. Claim 32 similarly has been amended to specify that what is fed to the phase separator is "a portion or all of a remainder of said crude phenol stream" after "separating acetone from a crude stream of phenol." This amendment is not a narrowing amendment, but merely gives an affirmative name ("a remainder") to the stream treated according to the previous claims.

With respect to the examiner's contention that "critical reaction steps" are omitted from the claims, the examiner has not specifically pointed out any such omitted "critical reaction steps." Applicant denies that the claims omit critical reaction steps, and traverses this technical rejection. Applicant respectfully requests that the examiner provide a "full development of the

reasons" for the rejection rather than merely giving a "conclusion coupled with some stereotyped expression." MPEP 706.03.

Applicant also traverses the rejection on the grounds that, as the claims were submitted, "one skilled in the art would understand all language in the claims when read in light of the specification." *Rosemount, Inc. v. Beckman Instruments, Inc.*, 221 U.S.P.Q. 1, 7 (Fed. Cir. 1984), citing *Caterpillar Tractor Co. v. Berco, S.P.A.*, 219 U.S.P.Q. 185 (Fed. Cir. 1983).

Applicant respectfully requests reconsideration and withdrawal of the rejections under 35 U.S.C. § 112.

Rejection for Obviousness

Claims 23-38 were rejected as obvious over U.S. Patent No. 5,847,235 and U.S. Patent No. 5,283,376 optionally in view of U.S. Patent No. 2,951,870 and U.S. Patent No. 5,510,543, and further optionally in view of U.S. Patent No. 5,962,751.

Response

-The applicable standards

In order to establish that the claims are *prima facie* obvious over the cited combination of references, the examiner must point to two things in the references, and not in the applicant's disclosure--(1) the suggestion of the invention, and (2) the expectation of its success. *In re Vaeck*, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991). See also MPEP 2143. As discussed more fully below, the examiner has not pointed to (1) in the cited references--the teaching or suggestion of the invention. It necessarily follows that the examiner also has not pointed to (2) in the cited references.

The examiner should withdraw the Dyckman '376 patent as a reference

The examiner has not pointed to a teaching or suggestion in the Dyckman '376 patent of a "a process **for removing salts of neutralization** present in a partially or wholly neutralized aralkyl hydroperoxide cleavage mass." Claim 23, emphasis added.

The salts removed by the claimed invention are formed when "the cleavage mass is neutralized with a caustic, such as sodium hydroxide, to prevent the acidic cleavage mass from corroding downstream equipment." Specification, page 1, ll. 25-29. As explained, "[m]uch of the salt is separated and removed from the process in a wash/phase separation step prior to feeding the partially or wholly neutralized cleavage mass to a splitter and further purification columns. However, a significant quantity of salt remains in the cleavage mass entering the splitter, and this quantity of salt becomes more concentrated as the stream passes from one purification column to the next." Specification, p. 1, l. 29-p. 2, l. 2. "It is in the cracker and furnace, and in the reboiler for the cracker, where the salts of neutralization settle and are no longer carried through. The settling of the salts in the cracker, reboiler, and furnaces causes operating problems, requiring intermittent shut down to clean the equipment or replace parts. The salts also degrade the value of a tarry mass as fuel for burning. Therefore, it is highly desirable to remove as much salt as possible prior to feeding a cracker or furnace." Specification, p. 2, ll.17-26. The claimed invention removes as much salt as possible using several aqueous streams to purge the salts of neutralization prior to feeding the remainder of the stream to a cracker or furnace.

In contrast, the Dyckman '376 patent approaches the salt problem by "avoiding the build up of salt in phenol tar." Dyckman '376, col. 2, ll. 8-12. The Dyckman '376 patent "separates

pure phenol from phenol tars, using a liquid-liquid extraction obtaining phenol tar free of phenol, reducing the quantity of waste water, reducing consumption of cumene and **avoiding the build up of salt** in the phenol tar." Dyckman '376, col. 2, ll. 8-12 (emphasis added). This approach is completely different than the claimed "process **for removing salts of neutralization** present in a partially or wholly neutralized aralkyl hydroperoxide cleavage mass." Claim 23, emphasis added.

The examiner has not pointed to a teaching or suggestion of a procedure in the Dyckman '376 patent that produces salts of neutralization. The examiner also has not pointed to a teaching or suggestion in the Dyckman '376 patent to remove salts from "a partially or wholly neutralized aralkyl hydroperoxide cleavage mass." Claim 23. The examiner has not even pointed to a teaching or suggestion to remove "salts of neutralization" from the phenol tar taught in the Dyckman '376 patent.

For the foregoing reasons, the Dyckman '376 patent should be withdrawn as reference against all of the claims for purposes of both anticipation and obviousness.

The examiner should withdraw the Dyckman '235 patent as a reference

The Dyckman '235 patent should be withdrawn as a reference because the examiner has not established that the teaching of the Dyckman '235 patent to remove salts from his "phenol tar" is a teaching or suggestion to remove salts from "a partially or wholly neutralized aralkyl hydroperoxide cleavage mass." Caims 23-38.

The Dyckman '235 patent describes a "phenol tar" as follows:

> Because of the presence of salts and the variation in composition, **phenol tar has not found uses of substantial commercial value and is primarily used as fuel oil or incinerated as waste of no value**.

Dyckman '235, col. 1, l. 50 - 53 (emphasis added).[2]

In comparison, the specification explains that "[i]n the course of making phenol, the fully or partially neutralized cleavage mass passes through several distillation and purification columns to ultimately form a stream of heavy by-products. **The heavy byproduct stream may be subject to cracking, and the bottoms of the cracker are usually incinerated.**" Specification, p. 2, ll. 3-8 (emphasis added). Apparently, the "phenol tar" described in the Dyckman '235 patent corresponds to the "heavy byproduct stream" described in the current specification and specified in the claims.

The examiner has not pointed to a teaching or suggestion in the Dyckman '235 patent to treat a "a partially or wholly neutralized aralkyl hydroperoxide cleavage mass" to remove salts of neutralization, as required of claims 23-38.

The examiner has not pointed to any teaching in any of the cited references to that it would be desirable to modify the Dyckman '235 patent to substitute "a partially or wholly neutralized aralkyl hydroperoxide cleavage mass" for the "phenol tar" in the Dyckman '235 patent. Nor has the examiner pointed to a teaching that any advantage could be gained by removing the salts of neutralization from the "partially or wholly neutralized aralkyl hydroperoxide cleavage mass" rather than from the "phenol tar."

For these reasons, the examiner has not established a case of *prima facie* obviousness of

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2 This interpretation of "phenol tar" is supported by the teaching of the Dyckman '235 patent that

> To perform salt extraction from phenol tar using water, countercurrent column- type multi-stage pulsing extractor is preferably. Extractant (water) feeds into the bottom part of the column and fills it as a continuous phase. The extract output exits from the top of the column. **Phenol tar (heavy phase)** feeds into the top of column."

claims 23-38 over the recited combination of references.

Rejection of claims 27 and 28 for anticipation

In order to establish a case of *prima facie* anticipation, the examiner must establish that the Dyckman '376 patent teaches "every limitation of the claimed invention, either explicitly or inherently." MPEP 2131; *In re Schreiber*, 44 U.S.P.Q.2d 1429, 1431 (Fed. Cir. 1997), citing *Glaxo Inc. v. Novopharm Ltd.*, 34 U.S.P.Q.2d 1565, 1567 (Fed. Cir. 1995). For the reasons given above, the examiner has not pointed to a teaching or suggestion in the Dyckman '376 patent of a "a process **for removing salts of neutralization** present in a partially or wholly neutralized aralkyl hydroperoxide cleavage mass." The examiner therefore has not pointed to a teaching or suggestion of every limitation of the claimed invention over the Dyckman '376 patent, even in view of U.S. Patent No. 5,510,543.

CONCLUSION

For all of the foregoing reasons, Applicant respectfully requests reconsideration and withdrawal of the remaining rejections and allowance of all pending claims.

Respectfully submitted,

Paula Morris
Reg. No. 31,516
Paula D. Morris & Associates, P.C.
2925 Briarpark, Suite 930
Houston, Texas 77042
(713)334-5151
FAX (713)334-5157
ATTORNEY FOR APPLICANT

Dyckman '235 patent, col. 3, ll. 63-col. 4, l. 1 (emphasis added).

CERTIFICATE OF MAILING

I hereby certify that this paper, along with any referred to as being attached or enclosed, is being forwarded to the Assistant Commissioner for Patents, Washington, D.C. 20231, via the United States Postal Service, First Class mail, Postage Prepaid, on 5/25, 2001.

E Peacock

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: **Taggart II, et al.** §
Serial No.: 09/304,298 §
Filed: May 3, 1999 §
For: Removal of Salts in the Manufacture of Phenolic Compound §

Group Art Unit: 1621

Examiner: Michael L. Shippen

Atty. Docket: SHELL-TH1118

MARKED UP COPY OF AMENDMENTS MADE IN FIRST OFFICE ACTION

Assistant Commissioner for Patents
Washington, D.C. 20231

5. (Amended) The process of claim 1 [comprising] wherein (c) comprises:

(i) adding the diluent composition to the crude phenolic bottoms stream thereby forming a diluted crude phenolic bottons stream, and

(ii) subsequently mixing water [to] with the diluted crude phenolic bottoms stream, thereby forming a separable crude phenolic bottoms stream.

11. (Amended) The process of claim 6, wherein a portion of said aqueous phase in step d) is recirculated and used as the water in step [cii)] (c)(ii), and a portion of the aqueous phase is purged as a salt water purge.

15. (Amended) The process of claim 1, further comprising:

(c) separating said hydrocarbon [stream] phase into a light ends stream, enriched in phenolic comopunds, and a tarry stream enriched in tars, said tarry steam having a reduced amount of salts of neutralization relative to the crude phenolic stream.

16. (Amended) The process of claim 15, wherein at least a portion of said light ends stream is re-circulated to a neutralization zone in which an aralkyl hydroperoxide cleavage mass is neutralized.

27. (Amended) A process for manufacturing phenolic compounds comprising feeding a wholly or partially neutralized aralkyl hydroperoxide cleavage mass containing salts of neutralization to a splitter, separating acetone and phenol from said cleavage mass in the splitter, removing all or a portion of the phenol from the splitter as a crude phenol bottoms stream, followed by feeding said all or a portion of said [phenol] crude phenol bottoms stream to a phase separation vessel having a volume of 5000 gallons or less, based on 100 parts by weight per hour of cleavage mass feed to the splitter, and removing at least 80 wt.% of the salts of neutralization fom said [phenol] crude phenol bottoms stream.

29. (Amended) A process for removing salts of neutralization, comprising feeding an aralkyl hydroperoxide cleavage mass containing salts of neutralization to a splitter, separating acetone from a crude stream of phenol in said splitter, followed by feeding a portion or all of a remainder of said crude phenol stream to a phase separator as a feed comprising hydrocarbons, water, and salts of neutralization, the total amount of hydrocarbon feed from any source to said separator being less than 10 parts by weight per hour of said cleavage mass fed to the splitter, wherein at least 80 wt.% of the salts of neutralization are removed from said remainder of said crude phenol stream.

32. (Amended) A process for removing salts of neutralization from an aralkyl hydroperoxide cleavage mass containing salts of neutralization comprising separating acetone from said cleavage mass, followed by purging the salts of neutralization from a

remainder in an aqueous purge stream comprising at least 3 wt.% of the salts of neutralization and at least 90 wt.% water, based on the weight of the purge stream.

Respectfully submitted,

Paula D. Morris
2925 Briarpark, Suite 930
Houston, TX 77042
(713)334-5151
FAX (713)334-5157

ATTORNEYS FOR APPLICANT